

WHAT IS CLAIMED IS:

1        1. A method for efficient routing of mobile node packets comprising:

2                moving a mobile node from a first location to a second location, the second  
3                location being outside a home address of the mobile node;  
4                sending a configuration message from a mobile node along a path to a  
5                second node;

6                sending a confirmation message from the second node along the path to the  
7                mobile node, the confirmation message reserving resources in nodes in the path for  
8                a flow from the mobile node;

9                sending the flow containing at least one packet from the mobile node to the  
10                second node along the path;

11                classifying the flow by each node in the path based on a home address option  
12                in each at least one packet; and

13                routing the flow by each node in the path, each node in the path using the  
14                reserved resources associated with the flow based on the classification.

1        2. The method according to claim 1, wherein the mobile node comprises a  
2        mobile phone.

1        3. The method according to claim 1, wherein the second node comprises a  
2        phone.

1        4. The method according to claim 1, further comprising each at least one  
2        packet having a temporary source address in a source address field of each at least  
3        one packet and the home address of the mobile node in a destination option of each  
4        at least one packet.

1           5. The method according to claim 4, wherein the temporary source address  
2           comprises a Care of Address (CoA).

1           6. The method according to claim 1, wherein the home address option is in a  
2           header of each at least one packet.

1           7. The method according to claim 1, wherein the first location comprises a  
2           first IP subnet and the second location comprises a second IP subnet.

1           8. The method according to claim 1, further comprising configuring a  
2           classification function at each node to perform the classifying.

1           9. The method according to claim 1, wherein the home address comprises an  
2           IP address.

1           10. The method according to claim 1, wherein the nodes are part of an  
2           Internet Protocol (IP) network.

1           11. The method according to claim 1, wherein the node comprises a RSVP  
2           router.

1           12. The method according to claim 11, wherein the configuration message  
2           comprises a PATH message.

1           13. The method according to claim 11, wherein the confirmation message  
2           comprises a RESV message.

1           14. The method according to claim 1, further comprising:

2           moving the mobile node from the second location to a third location;

3           sending a second configuration message from the mobile node to a crossover  
4           node in the path, the second configuration message sent along a second path from  
5           the mobile node to the crossover node;

6           sending a second confirmation message from the crossover node to the

7           mobile node, the second confirmation message reserving resources in nodes in the  
8           second path for the flow from the mobile node; and

9           sending the flow from the mobile node to the second node along the second  
10          path between the mobile node and the crossover node and the path between the  
11          crossover node and the second node.

1           15. The method according to claim 14, further comprising sending a teardown  
2          message from the crossover node to a node in the path that is not between the  
3          crossover node and the second node, the teardown message being propagated to all  
4          other nodes in the path that are not between the crossover node and the second  
5          node, the teardown message causing each node in the path that is not between the  
6          crossover node and the second node to release the reserved resources for the flow  
7          from the mobile mode.

1           16. The method according to claim 15, wherein the crossover node and each  
2          node comprise a RSVP router.

1           17. The method according to claim 16, wherein the teardown message  
2          comprises a RESVTEAR message.

1           18. An article comprising a storage medium having instructions stored  
2       therein, the instructions when processed causing a router to perform:

3           receiving configuration information that configures the router to classify a  
4       received flow based upon a home address option in a destination option header of a  
5       packet in the flow if the address is present;

6           reserving resources in the router for a flow based on receipt of a message;

7           receiving the flow, the flow containing at least one packet;

8           classifying the flow by the router based on the destination option header in  
9       each at least one packet; and

10          routing the flow by the router, the routing using the reserved resources  
11       associated with the flow based on the classification.

1           19. The article according to claim 18, further comprising:

2           receiving a second message;

3           propagating the second message to other routers if appropriate; and

4           releasing the reserved resources for the flow in response to the second  
5       message.

1           20. The article according to claim 18, wherein the router comprises a RSVP  
2       router.

1           21. The article according to claim 18, wherein the at least one packet  
2       comprises an IP packet.

1           22. A network comprising:

2           at least one first node;

3           at least one second node; and

4 at least one router, each at least one router configured to classify a received  
5 flow based upon a home address option in packets in the flow if the address is  
6 present,

7 wherein one at least one first node sends a flow comprising at least one  
8 packet to one at least one second node, at least one router reserving resources in  
9 the router for the flow based on receipt of a previous message, the at least one  
10 router classifying the flow based on the home address option in each at least one  
11 packet, and routing the flow using the reserved resources associated with the flow  
12 based on the classification.

1 23. The network according to claim 22, wherein the one at least one first  
node is a mobile phone.

1 24. The network according to claim 22, wherein the address comprises a  
home address of the at least one first node.

1 25. The network according to claim 22, wherein the one at least one second  
node comprises a phone.

1 26. The article according to claim 22, wherein the at least one router  
comprises at least one RSVP router.

1 27. The article according to claim 22, wherein the at least one packet  
comprises an IP packet.

1 28. The article according to claim 22, wherein the home address option is in a  
destination option header in the at least one packet.

1           29. A router comprising:

2           a reservation module, the reservation module reserving resources for a flow in

3           response to receipt of a message from a second node;

4           a receiving module, the receiving module receiving the flow comprising at

5           least one packet, the flow originating at a first node and having a destination of the

6           second node;

7           a classification module, the classification module classifying the received flow

8           based upon a home address option in the at least one packet in the flow if the

9           address is present; and

10          a routing module, the routing module routing the received flow using the

11          reserved resources associated with the flow based on the classification.

1           30. The router according to claim 29, wherein the message comprises a

2           RESV message.

1           31. The router according to claim 29, wherein the home address option is in a

2           destination option header in the at least one packet.

1           32. The router according to claim 29, wherein the at least one packet

2           comprises an IP packet.

1           33. The router according to claim 29, wherein the address comprises a home

2           IP address of the first node.

1           34. The router according to claim 29, wherein the first node comprises a

2           mobile phone.

1           35. The router according to claim 29, wherein the second node comprises a

2       phone.

1           36. A method for efficient handoff of a mobile node flow comprising:

2       sending a flow containing at least one packet from a mobile node to a second

3       node along a first path;

4       sending a first message from the mobile node along a second path to the

5       second node, the second path including one at least one node in the first path; and

6       sending a second message from the mobile node to at least one of the

7       second node and the one at least one node, the second message triggering the

8       sending of a third message from at least one of the second node and the one at least

9       one node to the mobile node, the second message triggering a mapping between a

10      home address and a temporary address of the mobile node in each at least one

11      node in the second path.

1           37. The method according to claim 36, wherein the mobile node comprises a

2       mobile phone.

1           38. The method according to claim 36, wherein the second node comprises a

2       phone.

1           39. The method according to claim 36, wherein the at least one packet

2       comprises an IP packet.

1           40. The method according to claim 36, wherein the at least one node

2       comprises a RSVP router.

1           41. The method according to claim 36, wherein the temporary address

2           comprises a care of address of the mobile node.

1           42. The method according to claim 36, wherein the first message comprises

2           a binding update message.

1           43. The method according to claim 36, wherein the second message

2           comprises a care of address advertisement RSVP message.

1           44. The method according to claim 36, wherein the third message comprises

2           a PATH message.

1           45. The method according to claim 36, further comprising sending the third

2           message from the one at least one RSVP router to the second node.

1           46. The method according to claim 36, further comprising sending a fourth

2           message in response to the third message from the mobile node to the one at least  
3           one node, the fourth message reserving resources for the flow in each node in the  
4           second path between the one at least one node and the mobile node,

1           47. The method according to claim 46, wherein the fourth message

2           comprises a RESV message.

1           48. The method according to claim 36, further comprising sending a fifth

2           message from the one at least one node to the at least one node in the first path that  
3           is not in the first path between the one at least one node and the second node, the  
4           fifth message removing reservations for the flow.

1           49. The method according to claim 48, wherein the fifth message comprises

2       a RESVTEAR message.

1           50. The method according to claim 36, wherein the second message

2       comprises a PATH message.

1           51. The method according to claim 50, wherein the second message contains

2       an object containing the home address and the temporary address, each at least one  
3       node establishing a path state including the mapping between the home address and  
4       the temporary address if no path state for the flow has been established.

1           52. The method according to claim 51, comprising updating the path state if a

2       path state for the flow has been established and the mapping between the home  
3       address and the temporary address has changed.

1           53. The method according to claim 51, comprising not updating the path state

2       if a path state for the flow has been established and the mapping between the home  
3       address and the temporary address has not changed.